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H702 H741 H755

(56) Documents cited

GB 1130522 A	US 4777785 A	US 4500970 A
US 3924389 A	US 3840086 A	US 3789939 A
US 3720281 A	US 3570227 A	

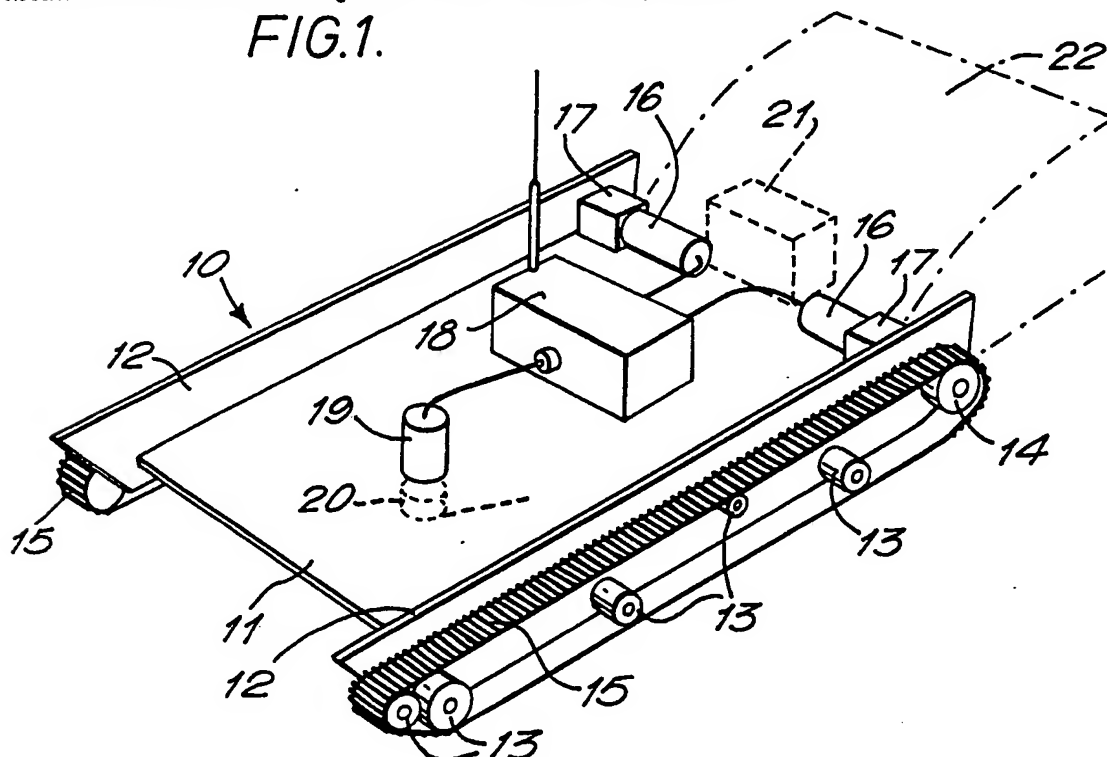
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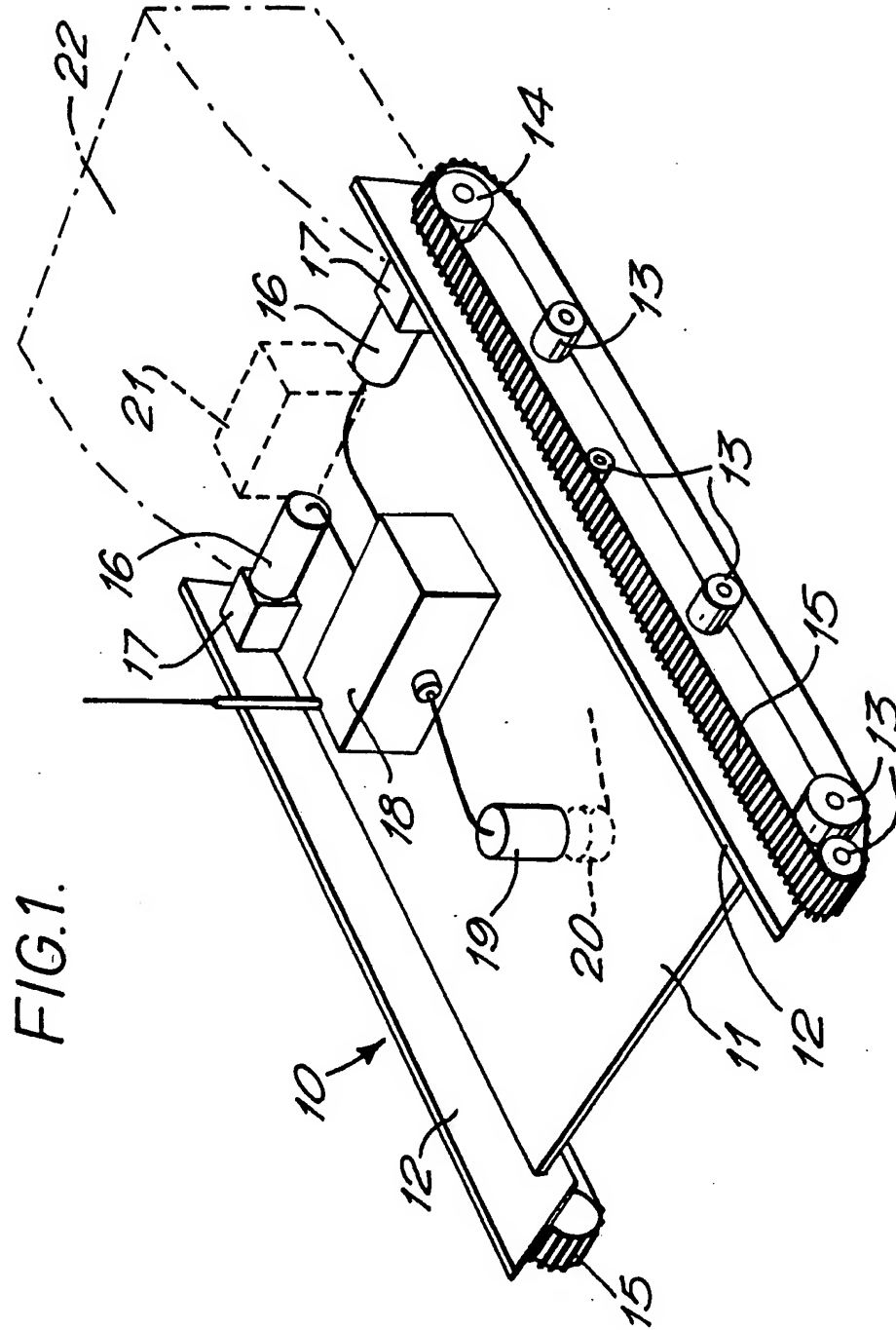
(54) Self-propelled mowing apparatus

(57) A self-propelled lawn mower which comprises a carriage (10), endless tracks (15) for supporting the carriage (10) for movement over the ground, drive wheels (14) for driving the tracks (15), the drive wheels (14) being driven by electric motors (16) controlled by control means (18) supplied with control signals from a remote controller or onboard computer whereby directional control of the mower is achieved by driving one wheel (14) faster or slower than the other. Cuttings are received in a disposable bag 20 which may be moved sequentially from a supply on the machine. The bags may be self-closable when removed and biodegradable. Motor 19 drives rotary cutter 20.

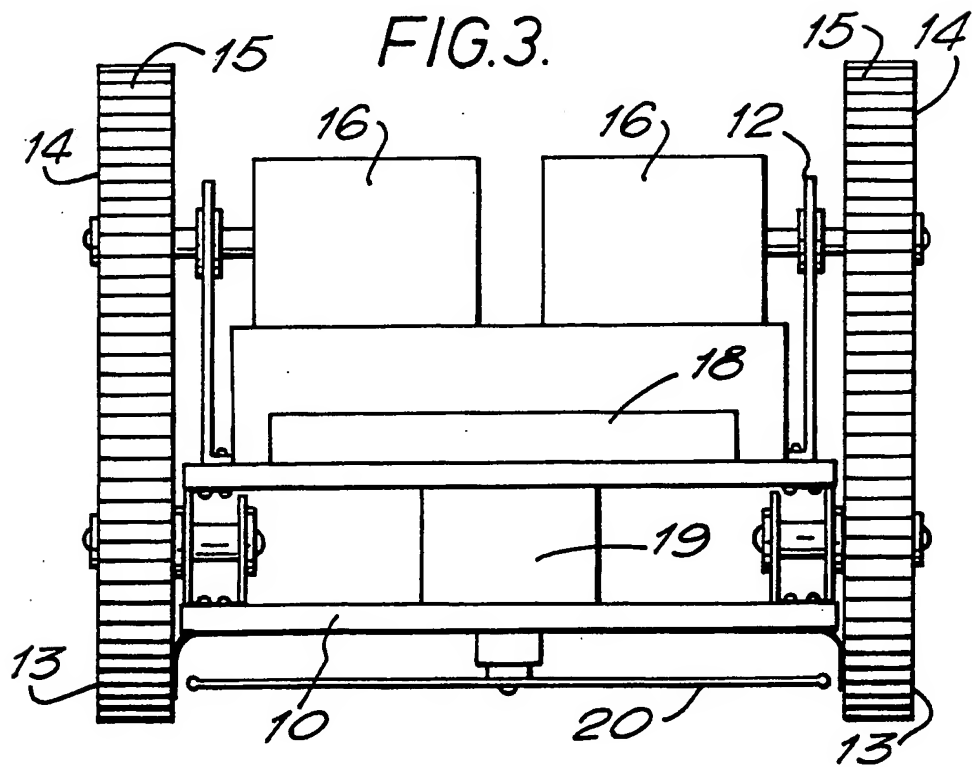
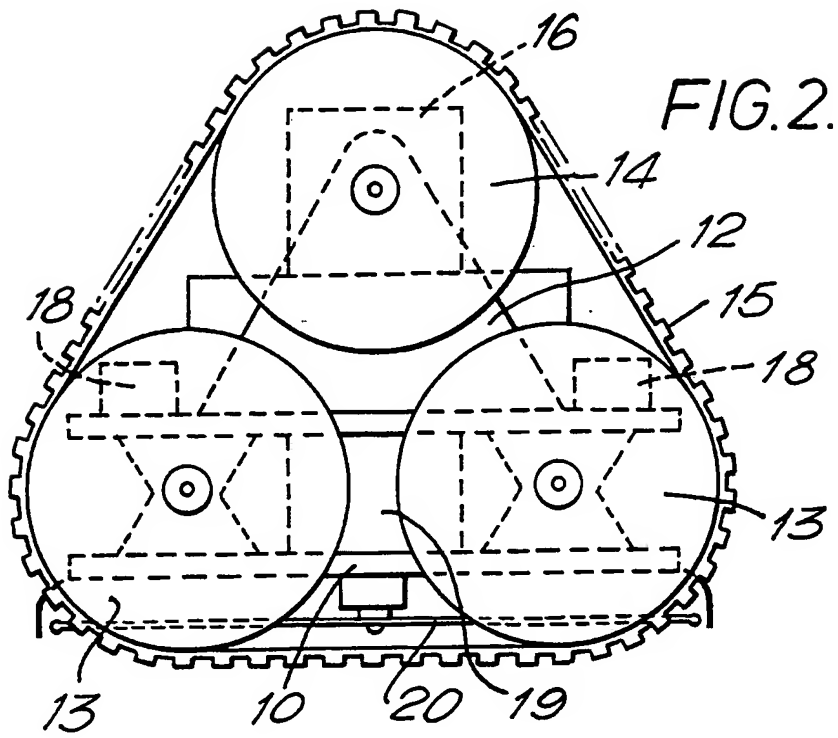
FIG.1.



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SELF-PROPELLED MOWING APPARATUS

This invention relates to a self-propelled grass mowing apparatus and particularly, but not exclusively, to a self-propelled lawn mower.

According to the present invention there is provided a self-propelled grass mowing apparatus, comprising a carriage, means for supporting the carriage for movement over the ground, drive means for driving said supporting means, rotatable cutting means located beneath the carriage, drive means for rotating the cutting means, control means for controlling operation of at least said drive means for said supporting means, and a controller for providing control signals to said control means.

The controller may be a remote radio signal transmitter or an infra-red transmitter or an onboard programmed computer.

Preferably the means for supporting the carriage for movement over the ground comprises an endless track or belt located on opposed side edges of the carriage.

Two embodiments of the invention will now be described, by way of examples, with reference to the accompanying drawings in which:-

Figure 1 is a diagrammatic perspective view of a first embodiment of a grass mower embodying the present invention;

Figure 2 is a side elevation of a second embodiment of a grass mower embodying the present invention; and

Figure 3 is an end elevation of the grass mower shown in Figure 2.

The mower shown in Figure 1 has a carriage 10 which consists of a flat base plate 11 and vertically extending side walls 12 disposed on opposite side edges of the base plate 11. Rotatably mounted on the side

walls 12 are pulleys or wheels or sprockets 13 and a drive pulley or wheel or sprocket 14. Each of the pulleys or wheels or sprockets 13, 14 engage with an endless belt or track 15.

5        Each drive pulley or wheel or sprocket 14 is driven by an electric motor 16 through a gear box 17. It will be appreciated that each drive pulley or wheel or sprocket 14 when driven by its respective motor 16 will drive the respective belt or track 15 so as to move  
10 the carriage 10 over the ground and that directional control can be achieved by driving one drive pulley or wheel or sprocket 14 faster or slower than the other drive pulley or wheel or sprocket 14. Preferably the endless belt or track 15 comprises a belt formed of an  
15 elastomeric material, such as natural or synthetic rubber, having transversely extending ribs on its outer surface. Alternatively, the endless belt or track 15 may comprise a plurality of links or plates hinged one to another.

20        Mounted on the base plate 11 is a control unit 18 electrically connected to the electric motors 16 and to an electric motor 19 which is mounted on the base plate 11 and whose drive shaft is connected to a rotary cutting device 20 located on the underside of the base  
25 plate 11.

      The rotary cutting device 20 may comprise a rigid cutter blade rotated by the motor 19 or a cord which extends outwardly from a reel rotated by the motor 19 or  
30 cutter arms or blades which are pivotably connected to a rotor rotated by the motor 19. Instead of the motor 19 driving a rotary cutter 20 it can be positioned or arranged to drive a horizontally disposed cutting cylinder.

      The control unit 18 and motors 16 are powered by a  
35 battery (not shown) mounted on the carriage 10 and the control unit 18 includes a receiver for receiving radio

signals transmitted from a remote transmitter. Preferably, such signals are transmitted over a narrow wave band.

5 Alternatively the control unit 18 includes a computer having a stored pre-programmable programme. In such a case the carriage 10 can be initially moved over the area of grass to be mowed and the movement of the carriage 10 required to mow the area is recorded and stored in the programme. Thereafter, merely by  
10 energising the control unit 18 the carriage 10 will be automatically driven over the area in the pattern of movement stored in the computer memory. The memory may be capable of being adjusted in case the machine strikes an object causing it to stop or go off course.

15 The carriage 10 may be provided with a fan 21 or other means for creating a vacuum to suck up the grass cuttings and for depositing them in a container 22 which may be mounted on the carriage 10 or connected to the carriage 10 so as to be towed behind the carriage 10.  
20 The container 22 may comprise a disposable bag.

The carriage 10 may be moulded from a plastics material and be provided with a casing or cover.

As a safety precaution, means may be provided for automatically cutting out the drive motors 16, 19 if the  
25 carriage 10 comes up against or strikes an obstacle in its path.

The carriage 10 may be provided with a plastics moulded characature mounted thereon.

Means may be provided for adjusting the height of  
30 the cutter device 20 above the ground. This can be done either by adjusting the cutter device 20 relative to the carriage 10 or by adjusting the position of the pulleys, wheels or sprockets 13, 14 relative to the carriage 10.

It is also possible to mount a roller on the  
35 carriage 10 or to connect a roller thereto.

The remote transmitter for the control unit 18 may

comprise an infra-red transmitter.

It is possible to provide ground markers or indicators or sensors which control the direction of the machine.

5        Figures 2 and 3 illustrate a second embodiment of a mower embodying the present invention. Parts which are identical with the parts described with reference to Figure 1 are indicated by similar reference numerals. In this embodiment the drive pulleys, wheels or  
10 sprockets 13, 14 are mounted in a triangular arrangement in order to reduce the length of the carriage 10 and the drive pulleys, wheels or sprockets 14 are directly driven by the motors 16.

15        There may be more than three pulleys, wheels or sprockets 13, 14 on each side of the carriage 10.

20        The grass collecting system of the mower may comprise a plurality of collapsible container bags and some means for moving the bags sequentially between an inoperative position in which they are flattened and an operative position in which the open end of each  
25        respective bag is placed in communication with a discharge opening for grass cuttings. The bags when full will be discharged and replaced with a new bag. Means may be provided for automatically closing the bags when they are removed.

The bags may be stacked in a container provided on the machine and moved sequentially from the stack.

30        Alternatively, the bags may be carried on a plurality of arms rotatably mounted on the machine and arranged to locate a bag in communication with the grass discharge opening.

The bags may be bio-degradable so that a full bag can simply be disposed of in a rubbish tip.

CLAIMS

1. A self-propelled grass mowing apparatus, comprising a carriage, means for supporting the carriage  
5 for movement over the ground, drive means for driving said supporting means, rotatable cutting means located beneath the carriage, drive means for rotating the cutting means, control means for controlling operation of at least said drive means for said supporting means,  
10 and a controller for providing control signals to said control means.
2. A self-propelled grass mowing apparatus as claimed in claim 1, in which said drive means comprise electric  
15 motors.
3. A self-propelled grass mowing apparatus as claimed in claim 1 or claim 2, in which the controller comprises a remote radio signal transmitter or an infra-red  
20 transmitter.
4. A self-propelled grass mowing apparatus as claimed in claim 1 or claim 2, in which the controller comprises an onboard programmed computer.  
25
5. A self-propelled grass mowing apparatus as claimed in claim 4, in which the computer includes a stored pre-programmable programme.
- 30 6. A self-propelled grass mowing apparatus as claimed in any preceding claim, in which said means for supporting the carriage for movement over the ground comprise endless tracks or belts located on opposed side edges of the carriage, each track or belt being  
35 drivingly engaged by a drive pulley, wheel or sprocket driven by an electric motor.



7. A self-propelled grass mowing apparatus as claimed in claim 6, in which each endless track or belt comprises a belt formed of an elastomeric material having transversely extending ribs on its outer surface.
- 5 8. A self-propelled grass mowing apparatus as claimed in any preceding claim provided with means for receiving and collecting the grass cuttings.
- 10 9. A self-propelled grass mowing apparatus as claimed in claim 8, in which said means comprises a plurality of collapsible container bags, means for moving the bags sequentially between an inoperative position and an operative position in which a bag is placed in  
15 communication with a discharge opening for grass cuttings, the arrangement being such that when a bag is full of grass cuttings it is removed from connection with the duct and replaced by an empty bag.
- 20 10. A self-propelled grass mowing apparatus as claimed in claim 9, in which the bags are self-closable when disengaged from the duct.
- 25 11. A self-propelled grass mowing apparatus as claimed in any preceding claim, including means for automatically cutting out the drive motors if the carriage contacts an obstacle in its path.
- 30 12. A self-propelled grass mowing apparatus substantially as hereinbefore described with reference to and as illustrated in Figure 1 or Figures 2 and 3 of the accompanying drawings.

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